



April 2012 Progress Report

1. **Award Title:** Great Lakes Regional Integrated Sciences and Assessments Center
2. **Performance Period:** May 1, 2011 through April 30, 2012
3. **Team Members**

Co-Directors

Donald Scavia, University of Michigan
Thomas Dietz, Michigan State University

Core Team

Jeffrey Andresen, Michigan State University
Ken Frank, Michigan State University
Melinda Huntley, Ohio Sea Grant
Maria Carmen Lemos, University of Michigan
Chuck Pistis, Michigan Sea Grant
Richard Rood, University of Michigan
Marilyn Thelen, Michigan State University Extension
Julie Winkler, Michigan State University

Staff

David Bidwell, GLISA Program Manager
Laura Briley, Research Associate
Daniel Brown, Research Associate
Catherine Kent, Undergraduate Research Assistant
Youngmi Lee, Post-Doctoral Research Fellow

Supported Graduate Students

I-Chien Chen, Michigan State University
Meghan Hart, Michigan State University
Scott Kalafatis, University of Michigan
Evan Oswald, University of Michigan

4. **New Areas of Focus or Partnerships**
In this, its first full year of operations, GLISA developed several new partnerships and areas of focus. Several key activities are highlighted below:

Great Lakes Adaptations Assessment for Cities (GLAA-C)

Funded by the Kresge Foundation and the U-M Graham Sustainability Institute, this project is engaging five cities from across the Great Lakes region in an integrated assessment of climate-related risks. GLISA Co-PIs Maria Carmen Lemos (U-M) and Ricky Rood (U-M) are members of the GLAA-C project team, and a GLISA staff member has been designated to provide climate information support to the project.

Making Climate Resilient Communities

The Huron River Watershed Council (HRWC) received a grant from the Mott Foundation to conduct an assessment of climate risks and opportunities for adaptation in the Huron River watershed, which drains 908 square miles of southeast Michigan. GLISA worked with HRWC staff to create fact sheets for the project kickoff meeting in December 2011. GLISA staff now attends all meetings of three working groups comprised of stakeholders from the watershed and provides guidance related to climate trends and projections.

Detroit Climate Action Collaborative

In early 2011, the Detroiters Working for Environmental Justice convened a process to develop a Climate Action Plan for the city of Detroit, Michigan. GLISA staff has attended the preliminary meetings of this group and provided the participants with background information on climate trends and projections. GLISA will continue to participate as a resource for sections of the Action Plan that deal directly with adaptation to the impacts of climate change and variability.

Great Lakes Region Station Climatologies

Discussions with stakeholders identified the need for local climatologies as a guide to understanding climate change and variability. GLISA staff is working with Co-PI Jeffery Andresen (MSU) and the Office of the Michigan State Climatologist to produce summaries of climatic data and trends for weather stations in the Great Lakes basin. The team intends to complete climatologies, and associated narratives designed for stakeholders, for 25-30 stations throughout the Great Lakes basin and post them on the GLISA website by the end of 2012. We are also exploring methods for automating the process to allow easy expansion of coverage.

5. Research Findings

GLISA co-PIs Maria Carmen Lemos (U-M) and Ken Frank (MSU), in collaboration with two other RISAs, have conducted an analysis of past assessments and reports of climate change and variability. This research included an analysis of the network of report authors. Here, we present three findings that have come from this research over the past year:

- Past assessments, by-and-large, did not translate information into clearly-defined policy responses, and even less frequently have they measured the costs and benefits that such responses would entail. Many documents cited the need for this kind of information.
- In the last few years, a new focus has been placed on how to make climate-related decisions under conditions of high uncertainty, perhaps in response to an acknowledgement that it is infeasible to eliminate uncertainty in climate projections.
- Network analysis revealed a link between network position and policy-oriented behavior; scientists who bridged between clusters of co-authors were more likely to

engage in policy-oriented behaviors than were those whose authorship was confined within a single cluster.

6. Accomplishments

National Climate Assessment

GLISA has played a key role in the Midwest region of the U.S. Global Change Research Program's National Climate Assessment (NCA). Led by co-PI Julie Winkler (MSU), GLISA collaborated with the USDA Agricultural Research Service to organize the Midwest Technical Input Team. The team of approximately 25 scientists from academia, federal agencies, and nongovernmental organizations developed 11 white papers, which review the current state of knowledge regarding the climate of the Midwestern U.S. and its impact on sectors of critical importance to the region. These white papers were submitted to the NCA Development and Advisory Committee on March 1. They are currently undergoing a peer review, and revised papers will be posted on the GLISA website. Moreover, co-PI Donald Scavia is a Convening Lead Author for the Midwestern Region chapter in the 2013 NCA report, and co-PI Thomas Dietz serves on the National Research Council Committee to advise the U.S. Global Change Research Program that will review the NCA.

glisacclimate.org

Overseen by co-PI Ricky Rood (U-M), GLISA has created an online problem-solving environment, glisacclimate.org. The site has been developed with input from stakeholders working on GLISA projects. Collaborators contribute resources that are important to their problem to the site's resource portal. The site also includes allows "tagging" of resources and provides a wiki environment for the co-creation of resources. GLISA anticipates this site will be a significant resource in working with recipients of its 2012 Great Lakes Climate Assessment grants (see below).

GLISA Annual Meeting

GLISA held its first annual meeting on November 2-4, 2011 at the University of Michigan in Ann Arbor. The meeting was comprised of three events:

- Four small working groups (8-12 individuals), comprised of diverse stakeholders from Michigan, Ohio, and Ontario, met for a full day to discuss key climate-related risks to specific sectors: agriculture, water management, tourism, and urban environments. A summary of these working groups is available at http://www.glista.umich.edu/news/events/GLISA_Working_Sessions_Summary.pdf
- A public forum was held on the afternoon of November 3. Speakers included members of the GLISA core team and recipients of 2011 GLISA Climate Assessment grants. A keynote address was given by Kathy Jacobs, director of the USGCRP National Climate Assessment. More than 75 individuals attended the symposium. All presentations were recorded and are available at http://www.glista.umich.edu/great_lakes_climate/glista_symposium.php
- Members of GLISA's Stakeholder and Science Advisory Committees met for a half day, during which they reviewed GLISA programs and provided advice for the upcoming year. A list of advisory committee members is available at http://www.glista.umich.edu/about/advisory_committees.php

Expanded Outreach Capacity

Over the past year, GLISA has dramatically expanded its capacity to communicate and interact with stakeholders in the region.

- We added a full-time research associate, whose primary responsibility is interpreting climate information for distribution to stakeholders and the public.
- With Michigan Sea Grant, we obtained a NOAA grant for expanding the capacity of extension professionals to address climate change and variability in the Great Lakes region (see #8 NOAA partnerships, below).
- The GLISA website (glisa.umich.edu and glisa.msu.edu) has been expanded and now includes or links to important climate-related resources. We also have an active presence on Facebook, to which we post climate-related news and events announcements. In addition, we have developed a list of more than 200 contacts to which we distribute a monthly e-newsletter (<http://glisa.umich.edu/listserv/index.php>).
- Through a NSF-funded Climate Change Education Program (CCEP) partnership, GLISA produced a 22-minute video to summarize climate change impacts in the Great Lakes region. This video was used in an online workshop for school teachers and is available on the GLISA website: http://glisa.umich.edu/great_lakes_climate/background.php

Great Lakes Climate Assessments Grants

A central component of the GLISA organization is a flexible research-funding program. GLISA implements this program through an annual funding competition for Great Lakes Climate Assessments Grants.

- In 2011, five grants of approximately \$30 thousand each were awarded to academic researchers to conduct projects that will fill important gaps in knowledge about climate impacts in the region. Topics included impacts to agricultural yields and water resources, rates of evaporation in the Great Lakes, impacts to a key fishery, implications for the tourism industry, and extreme heat events and public health.
- In April 2012, GLISA released its call for letters of interest in grants for this year; however, based on input from our advisory committees, this year's competition is designed to encourage community-driven projects that will expand GLISA's role as a "boundary organization" to a broader array of intermediate boundary organizations. More information about this year's grant competition is available at <http://glisa.umich.edu/research/2012grants.php>.

7. Completed Publications, White Papers, or Reports**Peer-Reviewed Article**

Frank, K., I. Chen, Y. Lee, S. Kalafatis, T. Chen, Y. Lo, and M. Lemos. 2012. Network location and policy-oriented behavior: An analysis of two-mode networks of co-authored documents concerning climate change in the Great Lakes region. *Policy Studies Journal*. In press.

White Papers

As a leader for the Midwest Technical Input Team, GLISA produced 11 white papers that were submitted to the National Climate Assessment Development and Advisory Committee

on March 1, 2012. These white papers are under review and will be posted on the GLISA website.

Andresen, J., S. Hilberg, and K. Kunkel. 2012. Historical climate and climate trends in the Midwestern USA.

Beecher, J.A. and J.A. Kalmbach. 2012. Climate change and energy.

Hall, K. 2012. Impacts and adaptation in the biodiversity and ecosystems sector.

Hatfield, J. 2012. Agriculture in the Midwest.

Lofgren, B., and A. Gronewold. 2012. Midwest region, water resources sector.

Nicholls, S. 2012. Outdoor recreation and tourism.

Patz, J. 2012. Health.

Posey, J. 2012. Climate change impacts on transportation in the Midwest.

Winkler, J., R. Arritt, and S. Pryor. 2012. Climate projections for the Midwest: Availability, interpretation and synthesis.

Handler, S.D., C.W. Swanston, P.R. Butler, L.A. Brandt, M.K. Janowiak, M.D. Powers, and P.D. Dutton. 2012. Climate change vulnerabilities within the forestry sector for the Midwestern United States.

Mackey, S.D. 2012. Great Lakes nearshore and coastal systems.

8. NOAA Entity and/or NOAA Regional Partners

This year, GLISA submitted a proposal with Michigan Sea Grant and was awarded a Great Lakes Climate Extension Capacity Building grant. This grant allowed Michigan Sea Grant to hire a full-time climate outreach specialist, housed in the GLISA offices, who will develop outreach materials and provide training for Sea Grant extension professionals in the Great Lakes region.

9. NCA Activities

In addition to the white papers and other direct NCA activities outlined above, GLISA remains committed to the principles of a continuing national assessment and plans to maintain its leadership role in the ongoing assessment of climate variability and change in the Great Lakes region. At this time, GLISA has not formalized a role in the ongoing assessment.

10. matrix

PI	Project Title	End Date	Deliverables/ Products	Abstract/ Description	Partners	RISA-led? (A=yes; B=no)	If B, primary lead
Rood	GLISAClimate.org	N/A	Online problem-solving space	With input from stakeholders, the team has is developing an online problem-solving environment. The site provides a space for working on GLISA partnerships and features a resource portal.	Huron River Watershed Council; City of Ann Arbor; NCPP	A	
Winkler	NCA-Midwest Technical Input Team	5/2012	White papers	A team of 25 scientists produced 12 white papers regarding climate trends, projects, and impacts in the Midwest region. These white papers are under review and will be available on the GLISA website.	MSU; USDA Agricultural Research Service; USDA Forest Service; The Nature Conservancy; Indiana University;	A	
Frank and Lemos	Great Lakes Climate Network Study	N/A	Peer-reviewed articles	This project investigates the relationships among experts and stakeholders working on climate issues in the Great Lakes region. To date, this project has focused on authors of past assessment and reports on climate issues.	MSU; U-M	A	
Andresen	Great Lakes Station Climatologies	N/A	Summaries of historical climate information and trends	Working with weather station data, a team is developing climatologies and narratives for locations throughout the Great Lakes basin. This information will be posted on the GLISA website.	Office of the Michigan State Climatologist	A	
	Great Lakes Climate Assessment Grants	N/A	White papers	Through an annual competition, GLISA provides grants to assess and address gaps in scientific information, stakeholder needs, and climate impacts in the Great Lakes region.		A	

Lenters	Assessing the impacts of climate variability and change on Great Lakes evaporation	8/2012	White paper	Variations in Great Lakes water levels impact numerous sectors, including hydropower, navigation, recreation, aquatic ecosystems, and shoreline residents. This project integrates and compares data from existing observational sites in Lakes Superior and Huron to assess the impacts of climate variability and change on evaporation rates	University of Nebraska-Lincoln; Northern Michigan University; University of Colorado-Boulder; Environment Canada;	A (funding)	University of Nebraska-Lincoln
Lynch	Designing a decision support system for harvest management of Great Lakes whitefish in a changing climate	8/2012	White paper	Whitefish are an ecologically and economically important species in the Great Lakes. Researchers are working with stakeholders to assess decision support tools for Great Lakes lake whitefish management in the context of climate change.	MSU	A (funding)	Michigan State University
Nicholls	An assessment of the implications of climate variability and change for Michigan's tourism industry	8/2012	White paper	This project assesses the potential impacts of climate variability and change on the winter sports and state parks in Michigan. Researchers interact directly with the winter sports industry and state park managers to identify vulnerabilities and options for adaptation.	MSU; Wageningen University; Crystal Mountain Resort and Spa; Portland State University	A (funding)	Michigan State University
Hyndman	Predicting the impacts of climate change on agricultural yields and water resources in the Maumee River Watershed	8/2012	White Paper	The Maumee River watershed encompasses areas of Southeast Michigan, Northeast Indiana, and Northwest Ohio. Based on meetings with stakeholders from this area, the researchers are developing a coupled crop-growth and hydrologic model to simulate scenarios of climate change impacts on crop yields and water resources across the watershed.	MSU	A (funding)	Michigan State University

Schmitt-Olabisi	A modeling framework for informing decision maker response to extreme heat events in Michigan under climate change	8/2012	White paper	This project assesses human health risks of extreme heat events in Michigan cities and is creating a dynamic modeling framework that tests policy and management options for reducing morbidity and mortality related to these events.	MSU; Michigan Department of Community Health; Michigan Department of Environmental Quality;	A (funding)	Michigan State University
Scavia	Climate Change Education program	9/2012	White paper	GLISA is a member of a 2-year, NSF-funded grant that assesses opportunities to increase the climate literacy of formal and informal educators in the Great Lakes region. GLISA has developed a white paper in climate impacts that will be integrated into a final report.	Eastern Michigan University; Michigan State University; College of Exploration	B	Eastern Michigan University
	Great Lakes Extension Capacity Building	1/2013	Training workshops and outreach materials	Via a NOAA grant, Michigan Sea Grant has hired a climate outreach specialist, housed in the GLISA offices for one year. This specialist will provide workshops on climate and decision making under uncertainty to Sea Grant extension specialists in the Great Lakes region.	Michigan Sea Grant	B	Michigan Sea Grant
	Making Climate Resilient Communities	12/2012	Fact sheets	GLISA is providing technical guidance to a local watershed council, which has convened stakeholders to assess climate impacts and discuss strategies for adaptation.	Huron River Watershed Council	B	Huron River Watershed Council
	Detroit Climate Action Collaborative	N/A		A Detroit-based nonprofit has organized an effort to assess the carbon footprint for the city, understand potential climate impacts, and identify strategies for adaptation. GLISA will contribute information on historical climate and projections.	Detroiters Working for Environmental Justice; MSU; U-M; Michigan Department of Community Health;		Detroiters Working for Environmental Justice

	Open Climate GIS	N/A		GLISA team members are in regular communication with Tyler Erickson, who is building an online, GIS-based portal for accessing climate projections.	Michigan Technical University	B	Michigan Technical University
	Great Lakes Adaptation Assessments--Cities	8/2014		With funding from the Kresge Foundation and the U-M Graham Sustainability Institute, a team of researchers is working with 5 cities in the region to assess climate impacts and develop adaptation strategies. GLISA is providing technical assistance and developing fact sheets on historical climate, future projections, and anticipated impacts.	U-M	B	University of Michigan